

Anaphora by pronouns

BERND WIESE

Abstract

An adequate conception of anaphora is still a desideratum. Considering the anaphoric use of third-person personal pronouns, the present study contributes to the solution of the question of what anaphora is. Major tenets of generative approaches to pronominal anaphora are surveyed; descriptive and methodological problems with transformational as well as interpretive treatments are discussed. The prevailing assumption that anaphora is a syntactically based phenomenon is shown to be inadequate. In particular, it is argued that pronominal anaphora does not constitute a case of either a syntactic (agreement) relation or a semantic (coreference) relation between antecedents and anaphors, i.e. linguistic expressions. In fact, there is no grammatical antecedent-anaphor relation that is essential to the description of pronouns. Pronouns are to be treated in their own right rather than by recourse to supposed antecedents. An account of the use of pronouns has to be based on a notion of speaker reference and on a unified description of lexical entries for pronouns that specify their meanings. Sample entries for English are suggested. It is emphasized that pronoun meanings reflect social, not biological, classifications of possible referents. To the extent that pronouns are used according to morphosyntactic features, as in languages like German or French, lexical entries for pronouns should specify the pronouns' 'associative potential'. Associative potential has the same function as conceptual meaning, viz. delimiting the associated extension. In addition to this, pronouns turn out to differ from 'normal definite nominals' only in the low conceptual content of their meanings. Pronoun occurrences that apparently agree with and are coreferential with referential antecedents are found to form a restricted subclass of pronoun use in general as well as of anaphoric pronoun use. Thus one must refrain from forcing each and every pronoun occurrence into this mold. Instead, anaphora by pronouns is characterized as a type of use where pronouns serve to refer to referents that the speaker considers to be retrievable from the universe-of-discourse.

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0. Introduction*

For two decades now the treatment of anaphora by pronouns has been a prominent field of interest within syntax and semantics. Unfortunately, in spite of immense research expenditure, what has been achieved is anything but a uniform and generally accepted approach to pronominal anaphora, let alone a uniform grammar of pronouns in general. In the light of this, it seems advisable to reconsider the basic assumptions that have guided these endeavors. If there is any one shared conviction underlying most treatments of the subject, it can probably be formulated as follows: pronominal anaphora is to be construed as a grammatical relation of some kind between certain linguistic expressions called antecedents and anaphors. The main point I want to argue for is that this assumption has to be repudiated; I submit that there is no grammatical antecedent-anaphor relation which is essential to the description of personal pronouns.

In order to revive the fundamental question of how the concept of anaphora is to be construed, I will consider some of the different relational approaches found in the literature — but not primarily for their own sake; the theories to be discussed will serve as examples of certain theoretical positions one might take in attempting to substantiate the relational idea. Problems any relational approach faces will thus be brought to attention. From this point of view, even the classical pronominalization theory is still of some interest insofar as the crucial theoretical attitude of this approach has survived within generative grammar. By this I mean the decision — as argued for in the classical paper by Lees and Klima (1963) — to handle anaphora as a syntactically based phenomenon.

There are two main arguments to this effect. The first one rests upon the assumption that there are constraints on anaphora that have to be formulated in terms of syntactic configurations. In this paper I will not go into the question of configurational constraints. But let me note that there is a tendency in recent publications to construe such constraints as 'a syntactic reflex' (Smith 1981: 236) of phenomena properly to be explained in semantic or pragmatic terms (see e.g. Dowty 1980; Reinhart 1983). The pertinent facts may quite adequately be explained by general principles of utterance interpretation and thus may not give rise to the conjecture that anaphora has a syntactic basis.

The second argument is based on the supposition that anaphora constitutes a case of syntactic agreement. The refutation of this conviction will be a primary subject of the first half of this paper. The second half will be devoted to questions of semantics. Pronouns' meanings are examined,

and it is argued that antecedent–anaphor relations are not needed for semantic reasons either. Instead, anaphora by pronouns has to be explained as a type of pronoun use which must be characterized in pragmatic terms.

The organization of this paper is as follows. Starting with a discussion of treatments of the subject within generative syntax, I examine which form a syntactic approach would have to take, if it were to figure as a possibly adequate theory of pronominal anaphora at all (section 1). The idea that anaphorically related items have to meet a condition of agreement has to date nearly always been adhered to. In section 2 a number of cases are enumerated where such a condition fails. Further support is given to the thesis that pronominal anaphora must not be construed as a syntactic phenomenon in section 3. Consequently, agreement as a condition on anaphora by pronouns should be dispensed with. In section 4, concentrating on gender, I show that an agreement condition is in fact not needed either for English — a language that has ‘natural’ gender — or for languages like German where gender is a morphosyntactic classification of words. More generally speaking, conditions on antecedent–anaphor relations can be dispensed with in the description of pronominal anaphora if the pronouns’ meanings (or what I call their associative potentials) are seen to control the pronouns’ use. These are discussed to some extent in section 5. In section 6, I try to show that an approach which takes coreference as basic must fail if coreference is presumed to be an ‘intralinguistic’ relation that can be described without recourse to considerations of extralinguistic reference. On the contrary, considerations of speaker reference must not be neglected. Thus a semantic relational approach whereby the reference of pronouns is to be fixed via antecedent–anaphor relations has to be rejected too. Instead, pronouns are regarded as picking up referents that are made available in the context. Section 7 shows that this idea can also be applied in the case of so-called ‘bound-variable pronouns’. Finally, section 8, introduced by a summary of arguments, provides some discussion of the resulting conception of what it means for a pronoun to be used anaphorically.

1. The form of a syntactic approach

Treating anaphora as a syntactically based phenomenon was no new idea originating from generative grammar. With respect to languages like German that show a more complex system of morphosyntactic features than English, the assumption that a pronoun ‘agrees’ in gender and number with that noun to which it ‘refers back’ (cf. e.g. Paul 1919: § 164) has a long

tradition. According to the transformational approach, a pronoun is a surface-structure substitute for an underlying 'full NP'. This NP has to be structurally and lexically identical to the NP which serves as the pronoun's antecedent. This identity condition thus covers the phenomena that have been traditionally treated under the caption of 'agreement'.

When a formulation of pronominalization rules is attempted, one problem area for any relational approach immediately becomes apparent: the delimitation of the antecedent which may be unclear. Paradigm cases are 'split antecedents' (cf. [1] from Wasow 1979: 75, n. 2) and 'Bach-Peters sentences' (cf. [2] from Bach 1970: 122):

- (1) John told his wife that they had been evicted.
- (2) I gave the book that he wanted to the man who asked for it.

A split antecedent *John ... his wife for they* in (1) obviously does not meet the identity condition.¹ As for (2), taking *the book that he wanted* and *the man who asked for it* as the antecedents of *it* and *he*, respectively, we are led into an infinite regress of 'inverted substitutions'. We may propose to define at least one of the antecedents so as to exclude the relative clause. But this will not only leave us with severe semantic problems (cf. Quine 1960: § 23; Daly 1975: 19f.); pronominalization may also give ungrammatical results if relative clauses are neglected (cf. below).

Even worse, the mere fact that pronouns may be used nonanaphorically means that not every pronoun has an antecedent. To provide for nonanaphoric pronouns too, Chomsky (1965) suggested assuming the existence of pronouns in deep structures (underlying nonanaphoric pronouns). Nevertheless, he insisted on employing a pronominalization transformation in order to explain ambiguities with respect to [\pm anaphoric] in terms of different sources of pronouns.

The *Aspects* treatment of pronouns was rejected by Dougherty (1969). It was claimed to be 'descriptively inadequate' since it obscured the uniformity of anaphoric and nonanaphoric personal pronouns. In general — that is, 'in positions where nouns and non-anaphoric pronouns can freely occur' (Chomsky 1977: 127, n. 12) — any personal pronoun that may be given an anaphoric interpretation may also be understood nonanaphorically. This fact ('the anaporn relation') should be accounted for by an adequate theory. But the 'two-sources approach' cuts across what appears to be a natural class of phenomena by distinguishing anaphoric personal pronouns from nonanaphoric ones.²

Wasow makes a somewhat similar point though he formulates it in a methodological vein as a kind of 'entities-are-not-to-be-multiplied-without-necessity argument'. Talking about Lees and Klima (1963), he states (1979: 13) that

It seems doubtful ... that they could have intended their Pronominalization transformation to account for non-anaphoric pronouns. Under these circumstances, one wonders why they proposed the transformation at all, for they could have accounted for anaphoric pronouns with whatever mechanism they meant to use in deriving non-anaphoric pronouns.

Beyond this there are methodological flaws. Within the transformational approach the semantic difference between repeated nominals and NP-pronoun pairs has to be ensured by some special mechanism, viz. indexing: lexical items that are 'referentials' are assigned referential indices in the deep structure where sameness of index means identity of reference. Without this proviso, it would not be possible to distinguish between the deep structure of sentences (3) and (4) and they would thus be synonymous:

(3) The boy hurt himself.

(4) The boy hurt the boy.

But the formal differences of the surface sentences (3) and (4) are clearly sufficient to explain the differences in semantic interpretation. Obviously, the necessity of amending deep structures by introducing indices simply stems from the fact that the formal difference in surface structure has been abstracted away from the very structures that are supposed to be input to the semantic component — a dilemma which is, in fact, typical of the *Aspects* framework (cf. Wiese 1980). The 'solution' consists in creating a technical device that reintroduces into deep structures information which is available in the surface structure anyway — quite obviously an artifact of the theory.

From a semantic point of view, anaphora was taken to constitute coreference. Now, if one wants to treat anaphora, or for that matter coreference, as a syntactically based phenomenon, one must be able to identify relevant syntactic properties of syntactic units. But once referential indices are available within syntax they tend to live their own life. Identity of referential indices was made a condition on pronominalization. Thus the desired semantic result was guaranteed by introducing a mechanism of no intrinsic descriptive value into those syntactic structures that are to be interpreted semantically: the relationship between the syntactic and the semantic is turned upside down.

What we are concerned with here is not simply a weakness of some now out-of-date theory. Our methodological objection applies not only to the *Aspects* approach but to any approach to anaphora that relies in a similar way on having indices or variables in syntactic structures (hence it applies to quite a number of treatments that are still in circulation). So let me

elaborate the criticism a little. A comparison of indexing in *Aspects* with a common practice in logic of representing pronouns as bound variables will bring out more clearly what is wrong with the former. Peirce suggested that, for the purpose of syntactic disambiguation, one might use letters as in (5) and (6), assuming 'that like letters shall stand for the same thing' (1960: 162):

(5) John (A) told Bill (B) that he (A) had to go.

(6) John (A) told Bill (B) that he (B) had to go.

Peirce noted that he borrowed such cross-reference letters from the language of law. He thus implies that indexing letters serve a purpose within a certain regimented variety of a language. Quine, in his discussion of 'ambiguities ... of pronominal reference' (1960: 135), follows Peirce and observes that adoption of 'arbitrary letters used for cross-reference [that] are called variables' (1960: 136) from mathematical language — that is, 'the resort to variables ... to clear up structural ambiguities' (1960: 157) — is appropriate for 'practical temporary departures from ordinary language' (1960: 157). Similarly, Richard Montague used variables to represent pronouns in constructing an artificial language that was intended to represent a fragment of English (Montague 1974). In discussing the theory of definite descriptions, he took the view that such an artificial language 'should not attempt ... to mirror English too closely' (1974: 216) if simplicity and avoiding ambiguities are given priority.

The high value of regimented language e.g. for scientific purposes cannot be disputed. However, it is equally obvious that extending a natural language by devices that eliminate ambiguities, in this case devices that make anaphoric relations unambiguous, is one thing; discovering devices actually used in natural language is another. The thesis rejected by Peirce that 'no conceivable syntax could wholly remove the ambiguity [of a sentence like (5/6)]' (1960: 162) is equivocal: trivially, a syntax constructed for disambiguation can do it while a descriptive syntax cannot. I should like to reemphasize Montague's more prudent assertion, 'English sentences contain no variables' (1974: 216) and would like to add that English sentences do not contain indices, either. Introducing indices into syntactic descriptions of English sentences substitutes a syntactic basis of anaphora in lieu of demonstrating that there is one (provided they are not meant to be simply an arbitrary notational device for indicating the existence of a relation that is determined independently, see below).

The interpretive approach advanced by Dougherty (1969) claimed to overcome the shortcomings demonstrated. Dougherty abandons the idea of considering pronouns as substitutes for nominals: A uniform treatment

of anaphoric and nonanaphoric pronouns is aimed at by introducing all pronouns into deep structures. Finally, pronouns are not indexed for reference in deep structure, 'Instead, the possible referent of a pronoun is determined by an interpretive rule' (Dougherty 1969: 492). Dougherty considers his rules to be of a semantic nature because they are designed to specify possible referents for anaphoric pronouns. As a matter of fact, semantic information is not used for specifying whether an anaphoric relation holds. Dougherty's proposal should therefore be construed as the specification of a syntactic relation;³ more precisely, as a formulation of conditions that two given constituents must satisfy for the relation to hold between them. Let us call this syntactic relation 'anaphora relation' to distinguish it from an anaphoric relationship in a pretheoretical sense. Within the process of the composition of sentence meaning, existence of an anaphora relation may establish coreference provided certain additional conditions are satisfied.

As a result of all this we have arrived at the following clarification: If anaphora is a syntactically based phenomenon, it should be accounted for by specifying a syntactic relation, which in turn receives a semantic interpretation. (No importance need be attached to the kind of notational device for relations used; indexing is one.) What, then, could be the conditions on the existence of syntactic anaphora relations? Leaving aside configurational conditions, the upshot of Dougherty's rule is indeed very simple: a pronoun may be anaphorically related to a noun if, and only if, both agree with respect to number, person, and gender. Thus we are led back to the traditional position that served as our point of departure. The interpretive approach is appealing, so much so that it has remained the prevailing view in generative grammar that anaphora is a syntactically based phenomenon, i.e. that anaphoric relationships may be determined by a combination of syntactic conditions. In particular, while the theoretical status and the empirical content of configurational conditions became the subject of an open-ended debate, the agreement condition was generally taken for granted in spite of 'exceptions' that were recognized. Wasow — defending the interpretive approach — for instance, states (1979: 53), 'One essentially trivial condition on pronominal anaphora is that the pronoun must agree with its antecedent in person, number, and gender.' This conviction, it must be emphasized, is not, however, a matter of affiliation with a specific theoretical school. Reference to 'the requirement of number and gender agreement between the anaphor and its antecedent' (Kamp 1981: 283, quoted as an arbitrary example) can be found in most publications on the subject up to this very day. Let me then turn to an examination of the validity of this condition.

2. Problems with agreement

Split antecedents had been a problem for the transformational approach and they present a problem for the interpretive theory too. Of course, some difficulties (concerning morphemic identity of constituents and lacking lexical material; see Dougherty 1969) vanish, but do split antecedents actually meet the 'identity condition' of the new approach, i.e. the agreement condition? This is often supported by the claim that split antecedents agree with plural anaphors (e.g. Wasow 1979: 75, n. 2). Yet it is hard to see any sense in construing e.g. *John ... his wife* (i.e. two separated singular constituents) in (1) above as SYNTACTICALLY plural. Interestingly enough, Dougherty does not advance a rule for split antecedents. Split antecedents may even be anaphorically related to singular pronouns (cf. [7] from Karttunen 1977: 60):

(7) If Mary has a car or John has a bicycle it is in the garage.

Anaphora relations therefore cannot be established simply by considering the syntactic features of the (split) antecedent — whatever they may be — and the anaphor. Incidentally, there are also 'split anaphors'. Their antecedent may be either plural or singular; cf. (8), (9):

(8) Two hotel guests kissed in the reception hall. He seemed to like her a lot.

(9) A married couple kissed in the reception hall. He seemed to like her a lot.

Identity in number is not a trivial condition, as is already shown by Dougherty's own data (1969), cf. (10):

(10) Curval and Durcet each deflowered a girl and I knew them both.

Such cases of nonagreement in number led Dougherty to the assumption that his rules cannot apply to surface structures but involve intermediate structures ordered at a stage at least before conjunction reduction. A structure corresponding to (10) should include 'Curval deflowered a girl' as well as 'Durdet deflowered a girl'. At this level *both of them* should have a split antecedent *a girl ... a girl*. This, Dougherty thought, should pose no special problems, as one would need a rule for split antecedents anyway. However, localizing the assignment of anaphora at an intermediate level begs the problem, for split antecedents in turn constitute a dubious case of syntactic agreement between pronoun and antecedent.

Nonagreement between pronouns and antecedents is much more common than the 'exceptions' referred to in the literature would seem to suggest. As regards number, cf. (11) from Wasow (1979: 75 n. 2) and (12) from Hintikka and Carlson (1977: 20):

- (11) John bought a Veg-o-matic, after seeing them advertised on TV.
- (12) One contestant gave his answer orally while others wrote them down.

Cf. also (13) from Carlson (1977):

- (13) Kelly is seeking this kind of animal, and Horace is seeking it/them as well.

Carlson (1977: 437 n. 17) comments, 'I am not sure why this variation of pronominal form is tolerated, but sometimes one, and then the other, seems preferable.' Another type of nonagreement in number is found in colloquial British English, where *they* may be used 'as a convenient means of avoiding the dilemma of whether to use the *he* or *she* form' (Quirk and Greenbaum 1973: 182):

- (14) Everyone thinks they have the answer.

Additional examples have been collected by Pulgram (1978).

Nonagreement in number is widespread in English but nonagreement in gender can only be shown in a language like German. The reason is simply the following: contrary to what is assumed by Dougherty and Wasow, it does not seem to be an indisputable fact that there is a formal, i.e. morphosyntactic, gender system in English. In German, however, gender is a syntactic classification. This is obvious where grammatical and 'natural' gender do not coincide. Any reference grammar provides examples like (15) and (16) (cf. also Corbett 1979: 205):

- (15) Ich habe das Mädchen gesehen, wie es das Haus verließ.
'I saw the girl as she left home.'

In (15) the neuter pronoun *es* is anaphorically related to a neuter antecedent. However, as the referent of the antecedent is female, one may also choose a feminine pronoun; cf. (16):

- (16) Ich habe das Mädchen gesehen, wie sie das Haus verließ.
'I saw the girl as she left home.'

Suppose, for argument's sake, that personal pronouns in English do fall within the domain of a formal gender system. This system would presumably have to include a classification such as 'animate vs. inanimate'. A noun like *ship* would belong to inanimate since it is compatible with *which* but not with *who*. If anaphoric personal pronouns are to agree with their antecedents, *ship* could only figure as an antecedent to *it*. Insofar as *she* is used as an anaphor to *ship*, we may take this again as a counterexample to the agreement condition. Regardless of how we construe gender in English, agreement in gender is no proper condition

for anaphora: either gender agreement does not apply to English personal pronouns, or it is not a necessary condition.

As far as person is concerned, identity of features cannot be a relevant condition, for nouns (other than pronouns) are not classified for person. Agreement in person may be construed as compatibility between third-person personal pronouns and nouns. Since anaphora by pronouns is limited to third-person personal anaphors (cf. n. 25), there is no possibility of violating this condition, and it may simply be dropped; if agreement in person were an empirical condition, it would have to be responsible for blocking anaphora in sentences like (17) (cf. Wasow 1979: 53) where there is a pronominal antecedent:

(17) I deny that he is a communist.

Insofar as in (17) an anaphoric interpretation relating *he* to *I* is indeed blocked, this is not due to syntactic reasons: under normal conditions one must not use a personal pronoun other than the first-person personal pronoun for referring to oneself. But note that in an utterance of (17), *he* may well be used to refer to the speaker if accompanied by a pointing gesture.

In summary, analysis of the allegedly trivial agreement condition leads to the following result for English. Agreement in person is an empty requirement and therefore trivial indeed; agreement in gender either does not apply or is not necessary for anaphora; and number agreement is again not a necessary condition. Agreement may not be a sufficient condition either.⁴ Dougherty (1969: 517) presents (18) as an example where no anaphoric interpretation is possible although the agreement condition is satisfied (but cf. below):

(18) Curval and Durcet each deflowered a girl and I knew her.

Here again Dougherty has to resort to intermediate structures for anaphora (non)assignment; cf. also (19):

(19) Ein Traktat, $\left\{ \begin{array}{l} \text{das [neut.]} \\ \text{den [masc.]} \end{array} \right\}$ Fritz bewunderte, gefiel Karl nicht, weil
er [masc.] aus Deutschland stammte.
'A treatise that Fritz admired did not please Karl because it/he
came from Germany.'

The NP *ein Traktat* 'a treatise' may be either masculine or neuter. On principle, it may thus figure as an antecedent to *er* (masc.) or *es* (neut.). However, there is no way to decide whether *er* may in fact be related to *Traktat* in (19) without taking recourse to the gender of the relative pronoun, *das* (neut.) or *den* (masc.). But now it is Dougherty's solution of

the Bach–Peters paradox to take nouns, not NPs, as the antecedents of personal pronouns. Therefore he must consider only the antecedent head noun when interpreting the personal pronoun in (19) and cannot exclude an anaphoric interpretation relating *er* to *Traktat* even in cases where the relative pronoun reads *das* (neut.). This means that agreement is not a sufficient condition on anaphora with antecedents that are ambiguous with respect to syntactic features. By restricting antecedents to head nouns, it is true, Dougherty avoids being led into an infinite regress when dealing with Bach–Peters sentences. But like others who followed him, he overlooks the other horn of the dilemma: the syntactic features of the head noun of an NP may not suffice to determine whether it may enter into an anaphoric relationship to a given pronoun.⁵ Consequently, Dougherty’s treatment of the Bach–Peters paradox and the assumption that agreement is a sufficient condition on anaphora are incompatible.

3. The failure of the interpretive approach

How should we react? Recognizing the miscarriage of the transformational approach, Bach had suggested that we should look for ‘a semantic relation between independently chosen NPs and pronouns (from the base), a relation which must then be determined (at least) on the basis of surface structure relations’ (1970: 122). The unrestricted agreement condition that was meant to apply at some intermediate level does not work. We may still adopt Bach’s proposal: the unrestricted agreement condition may be replaced by a more complex surface-structure determination of the anaphora relation.

Different cases of anaphora must then be distinguished. Assume for now that number and gender are indeed syntactic features pertinent to anaphora — whether this is so depends on the language we are describing. First, consider the case in which a pronoun and a noun agree in all relevant features. Anaphoric interpretation is, as a rule, possible, but if a certain additional condition, say α , is satisfied, anaphora may be prohibited, such as in (18). In (10) and (18), more than one girl must be under discussion and this is what determines which pronoun may occur anaphorically. Dougherty presumes the reason to be the fact that no girl can be deflowered more than once. But then the semantics of the verb *deflower* must be among the factors that preclude an anaphoric interpretation of the pronoun in (18). Thus in α — presumably not a simple condition — we have to refer to a class of verbs that includes *deflower*. Probably this class can only be determined by a semantic criterion. Apart from α , there may be other conditions β , γ , etc., that preclude anaphora despite agreement.

Second, a pronoun and a noun may agree with respect to gender but

not with respect to number. Anaphoric interpretation is, as a rule, not possible, but if a certain additional condition, say α_1 , is satisfied, anaphora may still be allowed (cf. [11]). Further formal conditions may be included in α_1 , e.g. that the pronoun is plural while the supposed antecedent is singular and indefinite, but α_1 is likely to include semantic conditions as well, e.g. that the antecedent is interpreted as nonspecific.

Third, a pronoun and a noun may agree with respect to number but not with respect to gender. Again we need an additional condition, say α_2 . Applying α_2 , we would have to account for those cases traditionally labeled *constructio ad sensum*. As the Latin term indicates, it is the meaning of the antecedent that permits the choice of an anaphoric pronoun which does not agree with the antecedent. (For more examples from German, cf. Paul 1919: § 166.) Thus we would have to mention a noun class including nouns like *ship* (or *Mädchen*, in German) — obviously a class that can only be defined with the help of semantic criteria. Following this strategy we would replace the seemingly simple agreement condition by a complex theorem of the form (20):

- (20) Let f_1 and f_2 be syntactic constituents of a syntagma f with respect to a syntactic structure s . f_1 is anaphorically related to f_2 only if (A) and (B):
- (A): f_1 is a pronoun in s and f_2 is a noun in s .
 - (B): Either (B₁) or (B₂) or (B₃) ...
 - (B₁): f_1 and f_2 agree with respect to gender and number, and not (ψ).
 (ψ) : (α) or (β) or (γ) ...
 - (B₂): f_1 and f_2 agree with respect to gender and do not agree with respect to number, and (ϕ).
 (ϕ) : (α_1) or (β_1) or (γ_1) ...
 - (B₃): f_1 and f_2 agree with respect to number and do not agree with respect to gender, and (χ).
 (χ) : (α_2) or (β_2) or (γ_2) ...
- .
- .
- .

I do not intend to advance such a theorem. I use (20) to stress that the formal agreement condition would have to be weakened in a drastic manner. Subcases where anaphora does hold in spite of nonagreement as well as subcases where anaphora does not hold in spite of agreement would have to be specified at least partly in semantic terms. In general, every 'greek-letter clause' in (20) will contain semantic information.

Wasow (1979: 57) remarked on an anaphora rule of Postal's that

It seems somewhat unnatural that a rule of grammar ... which defines a criterion for anaphora in purely syntactic terms should have classes of exceptions which can be characterized only in semantic terms.

Exactly this situation holds for the agreement condition proposed by Wasow himself. More precisely, our attempt to rescue the interpretive agreement condition has failed for nonaccidental reasons. At the very least, a solution that escapes Wasow's own criticism is preferable.

Anaphora theorems of type (20) would have to go beyond the agreement condition and not only by introducing semantic clauses: referring to properties of the antecedent and the anaphor would not be enough, properties of other constituents would also be involved (e.g. meanings of verbs, as exemplified above). We may here consider another type of problem for the interpretive approach, the problem of 'missing antecedents'. The following examples come from a study by Grinder and Postal (1971) devoted to this topic:

- (21) Harry doesn't have a wife but Bill does and she is a nag.
- (22) Harry sank a destroyer and so did Bill and they both went down with all hands.

Assuming that *she* in (21) refers to Bill's wife and that *they* in (22) refers to the destroyers sunk by Harry and Bill, any syntactically based theory of anaphora is confronted with the problem that there are no proper antecedents for deriving these readings.⁶ As a solution, Grinder and Postal argued for the existence of the 'missing antecedents' in underlying structures. The interpretivists, who reject a transformational approach to anaphora (in this case, VP anaphora), would have to opt for 'a theory of antecedent-anaphor relations in which the antecedents are, in some cases at least, *not syntactic elements*' (1971: 276). But as noted by Grinder and Postal, distinguishing between two types of antecedents as semantic or syntactic is hardly reasonable because *they* in (22) would be assigned something like a mixed split antecedent, one syntactic (*a destroyer*), the other semantic ('a destroyer') — obviously an absurdity.

In defence of the interpretive approach, Wasow (1979: 110) has tried to counter this argument by the empty-structure hypothesis, which 'involves generating anaphors which look just like their antecedents, except that lexical insertion need not have taken place.' Presumably (21) would contain a null anaphor which has the structure of *have a wife*. Therefore (1979: 111), 'The missing antecedent argument ... is inapplicable, since the antecedent [for *she*] would not be missing, but just lexically empty.' Whatever the merits of this analysis may be, it does not apply to (22), for (22) contains 'the non-null anaphor *do so*' (1979: 122). This makes an

essential difference because Wasow argues convincingly against 'a theory ... in which non-null anaphors are themselves merely parts of larger, otherwise empty structures' (1979: 126, n. 17). Therefore the missing-antecedent argument still holds good. But, as the transformational approach to anaphora had to be abandoned, we arrive at a different conclusion to Grinder and Postal's from ten years ago. The consequence they took to be a *reductio ad absurdum* of the interpretive approach proves to be inevitable: 'Antecedents are, in some cases at least, not syntactic elements' (see above).

Consequently, one would have to complicate the anaphora theorem even more drastically. As argued above, one could not limit attention to formal features of the antecedent and the anaphor: both syntactic and semantic features of other constituents would have to be taken into account. Furthermore, one would have to allow for syntactic configurations that contain anaphoric pronouns without antecedents. It might still be possible to handle the previously mentioned cases of missing antecedents. True enough, there are no constituents in (21) and (22) which could be identified as antecedents of *she* and *they*, but there are nouns that are lexically identical with the heads of the 'missing antecedents'. The syntactic configuration in which an anaphoric interpretation of *they* is possible in (22) may be characterized by a number of statements, such as (1) the pronoun is preceded by a sentence coordination; (2) the first conjunct has an occurrence of *a destroyer* in object position; (3) there is no object in the second conjunct but there is an occurrence of the anaphoric phrase *do so*; (4) the pronoun is plural; etc. While it may not be literally impossible to extend a given anaphora theorem to cover cases of missing antecedents, it should have become obvious that this task, if feasible at all, cannot be performed by any simple rule but would require a theorem of unattractive complexity. Perhaps, then, we are confronted with a basic misconception: do we need a syntactic basis for anaphora at all? Consider the part of (22) that precedes the occurrence of *they*. The semantic interpretation shows that two destroyers, not one, are under discussion. So, it is a semantic fact that the speaker may refer to these two destroyers a second time by means of a plural pronoun.

Summing up, an approach that takes anaphora to be a syntactically based phenomenon should account for it by establishing anaphoric relations through conditions that antecedent and anaphor have to meet. Such an account should commit us to at least the following prediction. Whenever an anaphoric relation holds, there are (parts of) linguistic units whose status as antecedent and anaphor can be established beyond doubt. This prediction is hard to defend in the cases of split antecedents and Bach-Peters sentences and is falsified by cases of 'missing antecedents'.

Furthermore, there may be units which can reasonably be construed as antecedent and anaphor but for which even the most trivial condition for anaphora, viz. agreement, may be violated. Thus, there is a range of cases where anaphora cannot be dealt with in terms of a syntactic relation. The best a syntactic approach could provide is a treatment of SOME anaphoric relations. This would force us to posit two types of anaphoric relations, syntactic and nonsyntactic ones. The discussion of the interpretive approach to pronouns has thus taken us to a point where Wasow, in his discussion of the transformational approach, was led to brandish Occam's razor (cf. above). His argument may now also be used against the interpretive approach:

It seems doubtful that the interpretivists could have intended their rules to account for 'nonsyntactic' anaphoric pronouns. Under these circumstances, one wonders why they proposed the rules at all, for they could have accounted for 'syntactic' anaphoric pronouns with whatever mechanism they meant to use in interpreting 'nonsyntactic' anaphors.

4. The superfluity of agreement conditions

I have argued against any attempt to explicate anaphora on a syntactic basis. It may seem natural, then, to approach anaphora in purely semantic terms, and as early as 1972 Jackendoff proposed handling anaphora by applying a rule of semantic interpretation that does not rely on syntactic agreement. Jackendoff construes anaphora as a semantic relation of coreference, replacing the agreement condition by his 'consistency condition' (CC): if two NPs are marked as coreferential, 'those NPs must in fact be able to describe the same individual' (1972: 112). However, what exactly are the properties whereby two NPs are 'able to describe the same individual'?

Consider again features of nouns, in particular gender. Traditional grammars of English are, as a rule, at least compatible with the view that gender is a classification of words (cf. e.g. Kruisinga 1932).⁷ This possibility remains even after a syntactic gender system has been rejected; gender might be construed as a SEMANTIC classification of words. Every noun is assigned to a gender class that is nonsyntactic: the class is defined neither by formal features of nouns nor by their syntactic function. One might, then, explain anaphora as a relation of semantic agreement, where two NPs are able to describe the same individual if they agree with respect to certain semantic features. On this assumption, anaphoric pronouns in English, such as *he*, are selected in conformity with the semantic classification of their antecedents, such as *man* [+semantic-masculine],

just as a pronoun in a language like German, such as *er*, is, on the received view, selected as an anaphor to a noun like *Mann* [+syntactical-masculine] — the correct pronoun is determined by agreement. Thus, by interpreting the CC as a semantic-agreement condition, we would achieve a close parallel to languages like German, where gender, number, and person are syntactic categories. The approach could be extended to such languages by postulating that two NPs are able to describe the same individual only if they agree either semantically or syntactically.

Obviously, it would still not be much help to treat the syntactic features of the earlier approach as semantic features of agreement. All the problems of syntactic approaches are reintroduced through the assumption that the use of pronouns is based on a relation between antecedent and anaphor which is specified in terms of identity with respect to certain features. It might be more promising to consider the view that a classification like gender in English is not a classification of words. Instead it is often assumed that there is a 'classification of persons and objects as male, female or inanimate' (Lyons 1968: 164). These classes are supposed to correspond to the pronouns *he*, *she*, and *it*, respectively. This is a classification of referents (reference objects), not of linguistic expressions, and is therefore often called one of 'natural gender'.⁸ Given such a classification, semantic features of pronouns need not be interpreted as semantic-agreement markers but may be construed as defining classes of referents, specifying, in this way, what a pronoun 'is able to describe' (e.g. [+Male]). Semantic agreement may be dispensed with in favor of a requirement that makes the appropriate choice of an anaphoric pronoun dependent on the meaning of the antecedent: an anaphoric pronoun is selected so that the referent of the antecedent is an element of the class of referents that is associated with the pronoun. Still, it appears that phenomena like antecedents that are 'missing' or 'not present in discourse' present serious problems. But since semantic features of pronouns are now taken to delimit a range of possible referents, we would simply be characterizing meanings of pronouns specifying conditions of use WHICH APPLY REGARDLESS OF ANY ANTECEDENTS and therefore do not have to mention antecedents in their formulation.

In fact, conditions that make the appropriate choice of an anaphoric pronoun dependent on the form or meaning — and thus *a fortiori* the existence — of an antecedent are rendered superfluous. The CC in particular was intended to 'explain' the inconsistency that arises if two NPs are marked for coreference although they cannot refer to the same intended referent. However, this inconsistency is predicted anyhow once we have a definition of coreferentiality (see Jackendoff 1972: 287) and a specification of what an NP, or for that matter, a pronoun, can refer to.

Obviously, if a pronoun's meaning determines what it can be used to refer to, problems with agreement do not arise. Agreement as a condition on the use of third-person personal pronouns can simply be dispensed with.

However, despite the serious difficulties involved, there seems to be a striking argument in favor of an agreement approach, sometimes presented as follows. Take a language where pronouns are syntactically classified for, say, gender. Assume a context of discourse where things, not persons, are under discussion. What, then, could be the guideline for choosing a pronoun of a particular gender if not the gender of its antecedent? We thus seem to be forced into accepting some agreement rule, putting aside annoying counterexamples as exceptions. But this position is NOT a necessary consequence.

At first sight, it may seem impossible to deal with the role of formal features of pronouns — as opposed to semantic features — without involving antecedents. On close examination, it turns out that formal features of pronouns can be treated in analogy to semantic features. The crucial point is this: in the absence of antecedents, formal features of pronouns are still not 'inoperative'. Actually, this has not passed unnoticed in generative grammar. Tasmowski-De Ryck and Verluyten (1981) point out that pronouns without antecedent that are 'generally considered to be pragmatically controlled ... are in fact sensitive to aspects of linguistic form' (1981: 153); cf. their examples:⁹

- (23) (John wants his pants that are on a chair and he says to Mary:)

Could you hand $\left\{ \begin{array}{l} \text{them} \\ \# \text{ it} \end{array} \right\}$ to me, please?

- (24) (Same situation, but this time John wants his shirt:)

Could you hand $\left\{ \begin{array}{l} \text{it} \\ \# \text{ them} \end{array} \right\}$ to me, please?

And from French:

- (25) (John is trying to pack a large table [*la table*, feminine] into the trunk of his car. Mary says:)

Tu n'arriveras jamais à $\left\{ \begin{array}{l} \text{la} \\ \# \text{ le} \end{array} \right\}$ faire entrer dans ta voiture.

'You will never manage to get $\left\{ \begin{array}{l} \text{it (fem.)} \\ \text{it (masc.)} \end{array} \right\}$ into your car.'

- (26) (Same situation, but with a desk [*le bureau*, masculine]. Mary says:)

Tu n'arriveras jamais à $\left\{ \begin{array}{l} \text{le} \\ \# \text{ la} \end{array} \right\}$ faire entrer dans ta voiture.

'You will never manage to get $\left\{ \begin{array}{l} \text{it (masc.)} \\ \text{it (fem.)} \end{array} \right\}$ into your car.'

They comment that ‘the real-world objects *pants* and *shirt* do not have anything inherently singular or plural in them’ just as ‘the real-world objects *table* and *desk* are neither masculine nor feminine’ (1981: 153). Rather, ‘choice of the [appropriate] form of the anaphoric pronoun is affected by the *linguistic* antecedents: the English words *pants* (plural) and *shirt* (singular)’ (1981: 154), similarly for the French words *la table* (feminine) and *le bureau* (masculine). They ‘therefore conclude that linguistic factors play a role in all anaphora Some kind of pragmatic recoverability condition should be introduced to ensure that the linguistic antecedent can be inferred from the pragmatic context’ (1981: 154).

The facts illustrated by (23) to (26) are unequivocal. Any number of examples could be constructed from any language that has formal, nonsemantic features of pronouns: formal features of pronouns are pertinent to the use of pronouns without antecedents (cf. also [44] below). On the other hand, Tasmowski-De Ryck and Verluyten interpret these facts in a way that is definitely misleading, despite its preliminary form. It hardly makes sense to speak of ‘the linguistic antecedent’ of a pronoun that is characterized as not having one. There seems to be a tacit assumption by the authors that the formal features of any pronoun are controlled by an antecedent. Thus, if formal features are operative, there must be one. Pronouns without antecedents are thus forced into the mold of an apparently standard case by establishing a vague parallel in terms of recoverability.

I shall take the opposite line. No reference to antecedents is necessary to account for the examples (23) to (26): instead, we can simply rely on our knowledge of the lexicon of the language. To understand *them* in (23) as a reference to John’s pants, we must know that there is a plural noun in English, viz. *pants*, that may be used to refer to pants. Similarly, *le* in French is masculine and can therefore be used in connection with any referent that can be referred to by some masculine noun in French. Formal features and semantic features of pronouns, such as [+Masculine] of *le* in French and [+Male] of *he* in English, turn out to have essentially the same function: they delimit the range of what the pronoun ‘is able to describe’. A pronoun marked [+Masculine] requires a corresponding antecedent as little as a pronoun marked [+Male] requires an antecedent marked [+Male]. The role of semantic-pronoun features can be and must be described without mentioning antecedents and this holds for formal features, too. Given a formal feature, a pronoun may be used to refer to some object if the pronoun formally conforms to some noun that COULD be used to refer to that object. Thus formal features establish a relation between pronoun occurrences and items in the lexicon (which may or may not occur in the pronoun’s context).

5. Lexical meanings of pronouns

Now let us take a somewhat closer look at the role played by semantic and syntactic features in the use of pronouns, again concentrating on gender. I shall consider semantic features first. It is by no means clear that a 'natural gender' classification can be established in biological terms, say, by reference to sex organs.¹⁰ Leaving aside personifications of sexless things, typical of fairy tales, *she* may be used to refer to ships, countries, towns, '(especially by men) to lovingly handled objects' (Weinreich 1966: 405) or even (within homosexual circles) to male persons playing a female role. *It* may be used to refer to animals and babies or, as a pejorative, to any person. One may also use *he* or *she* to refer to certain animals without committing oneself to any assumption about their sex. Thus, use of personal pronouns in English is based on a classification of referents that is not correctly characterized as male vs. female vs. inanimate. It would be misleading to speak of 'natural gender' without the proviso that natural gender and sex must not be equated (cf. Kruisinga 1932).

To account for the use of *she*, we want a description of what it means for some object to be 'womanly' with respect to (a speaker of some variety of) English. A basic criterion for classifying pronoun referents for English is something like 'having personality'. It should provide us with two classes, one corresponding to *he* and *she*, the other to *it*. This criterion differs from [\pm Animate]; it allows for animate (living) beings treated as lacking personality (e.g. animals referred to by *it*), and also allows for inanimate things treated as having personality (e.g. a favorite car referred to by *she*). 'Animated' would be more appropriate than 'animate' to indicate the *he/she* domain. This domain is then subdivided in terms of 'manly' vs. 'womanly'. Typical candidates for classification as manly or womanly are creatures of male or female sex, but other properties such as social roles may be decisive. In the case of animals, the crucial question may be whether the SPECIES belongs to a male or female TYPE rather than the question whether an individual belongs to the male or female SEX: referring to a cat by *she* does not automatically entail that the cat is assumed to be female – *A cat would eat fish, but would not wet her feet*. Not only in story telling is *he* used to refer to big, male-type animals and *she* to small, female-type ones. When males and females of a single species are denoted by different words, the distinction between the marked term and the generic term may provide a cue.

As a matter of fact, 'manly' is not a very fortunate term for describing the referents of *he*, since *he* is often used generically.¹¹ 'Womanly' must also be understood to apply to inanimate objects which are conceived as animated but do not, of course, have sex. It is worth repeating that

different pronouns may be used to refer to a single referent. A baby may be treated as not yet having personality and referred to by *it*; if the baby's name and sex are known, it may be a referent of *he* or *she*. Similarly, a speaker may refer to a car by either *it* or *she* depending on how he feels about it¹² (for a collection of examples see Kruisinga 1932). It is not always properties of objects which are specifiable in biological or other scientific terms that commit a speaker to make use of a certain pronoun. The use of pronouns is controlled by the intention of the speaker to assign certain attributes. In other words, we do not need an improved objective classification of referents, but a specification of pronoun meanings. I shall assume that word meanings are concepts (Lieb 1979, 1980b), and tentatively posit¹³ 'manly', 'womanly', and 'nonpersonal' as meanings of *he*, *she* and *it*, respectively.¹⁴ (I will not enter into a specification of these concepts; this would require a specialized study of English, cf. e.g. Kruisinga 1932; Quirk and Greenbaum 1973.)

Characterizing pronouns in terms of an objective classification of referents would be futile for two reasons. First, such an attempt overlooks the fact that for pronouns, too, meaning and extension must be distinguished (see also Lieb 1983). A classification of referents of pronouns does not yield clear-cut classes. This raises difficulties for an 'objective-classification approach' but may be assigned to a general feature of natural language, vagueness of word meanings. Second, rather than being based on 'objective' categories, the semantics of *he/she/it* reflects human behavior in specific societies. The perspective is centered on man (in either sense of the word). Speaking metaphorically, the world is represented by three concentric circles. The human male is right in the middle, the paramount case of an 'animated' creature. Around him there is everything closely tied to male interest: women, countries, and cars, in particular. Left on the outside there is the rest: not 'animated', lacking personality.¹⁵ It is, so to speak, built into the language as a tacit assumption that men talk among themselves about what they themselves are doing. 'Lovingly handled objects' are therefore womanly, and *he* may be used in a generic sense (see also Stanley 1977).

There are two factors that control the use of pronouns. So far I have sketched the first factor, viz. conceptual meaning. The second factor consists of correspondences between lexical items. Let me reserve the term 'agreement' for syntagmatic relations between constituents of syntactic units. We may say that a pronoun CONFORMS to nouns of the same gender or, more generally, that a pronoun has a certain ASSOCIATIVE POTENTIAL due to formal lexical associations. Associative potential of a pronoun is comparable to conceptual meaning: it delimits the associated extension. Thus one may ask whether the associative potential of a pronoun is (one

of) its meaning(s). Meanings of this type would be distinguished by involving a reference to a language system in a sense that has been discussed by Roman Jakobson. Jakobson (1957: 130) classifies the ways in which 'the general meaning of a code unit may imply reference (*renvoi*) to the code or to the message'. To exemplify the case of 'code referring to code (C/C)', he used proper names (1957: 131):

The general meaning of a proper name cannot be defined without a reference to the code. In the code of English, 'Jerry' means a person named Jerry. The circularity is obvious: the name means anyone to whom this name is assigned.

Recently, Lieb, pursuing the same idea, proposed to assume conceptual meanings for proper names. For Jakobson's example the concept would be 'Jerry' (cf. Lieb 1981: 552):

'Jerry' = the concept whose intension is the set (Je) where $Je =_{df}$ the property of being an x such that x is called *Jerry* in S (a certain idiolect).

As stressed by Lieb, the intension of such a concept is 'language dependent (involves a property that presupposes a system of a certain language variety or an idiolect)' (1981: 553).

Third-person personal pronouns can be subsumed under category C/C, too. As for German, Lieb (1983) suggests meanings such as 'masc(S)' for *er*. The extension of this concept is the set of entities which are in the extensions associated with masculine substantives in S , a certain idiolect system. Thus, associative potential of personal pronouns can be reconstructed by assuming word meanings that involve 'a reference to the code'. This does not imply, however, that associative potential can always be reconstructed via word meanings. Lieb assumes that the concepts 'masc(S)', 'fem(S)', and 'neutr(S)' not only occur with personal pronouns but are also involved in the construction of meanings for units such as *Alte mag ich nicht* '(lit.:) old [fem.] like I not' (uttered after, say, *Wirf die Butter weg* '(lit.:) throw the butter [fem.] away'). *Alte*, by virtue of its feminine gender, is appropriate for referring to entities in the extension of 'fem(S)'. But if we were to make this part of its meaning we would have to posit different meanings for what are just differently inflected forms of one and the same adjectival lexeme, viz. *alter* [masc.], *alte* [fem.], *altes* [neut.]. If we assume that word meanings are to be assigned to lexemes, not to forms of lexemes, it follows that associative potential cannot always be handled in terms of word meanings. Instead, we may state that every nominal which does not have a substantival head has an associative potential. However, as long as we restrict our attention to personal

pronouns we can leave things where they are since pronouns such as *er*, *sie*, *es* are in fact different lexemes.

To some extent, these factors — associative potential and conceptual meaning — are applied alternatively, different languages opting for different sides. Thus, German and French exhibit a grammatical gender system, whereas English provides gender specification through pronoun meanings. Even in the former languages pronouns have conceptual meanings and are used according to these (cf. also Cooper 1975: 66f.). As was illustrated in (15) and (16), a girl may be referred to in German by *es* [neut.] 'it', due to existence of the word *Mädchen* [neut.] 'girl'; or else by *sie* [fem.] 'she', due to the fact that a girl is female.

One might object that conceptual meanings such as 'womanly' are superfluous for German pronouns (Lieb 1983 only mentions 'fem(S)' as a meaning of *sie*). We could also try to explain the use of *sie* in (16) by taking recourse to its associative potential: there are feminine words for referring to girls in German. However, such words are rare. Furthermore, we should account for the following fact: if the occurrence of *das Mädchen* is near to the pronoun, *es* is preferred, while if it is more distant, *sie* is more likely.¹⁶ This is easily explained if we assume that *sie* has both an associative potential (or a meaning dependent on a language system, for that matter) and a conceptual meaning (of a usual type). As is well known, under normal circumstances, the form of an utterance is sooner forgotten than its meaning. Therefore if the occurrence of *das Mädchen* is more distant, there is reason to believe that the hearer may only remember that a girl, a female person, is under discussion. Accordingly, the use of *sie* is more suitable (cf. also note 26).

Martinet (1962) has noted for French that '*elle* is sometimes used in reference to females who, in the same context, have been designated by means of a masculine noun' (1962: 18):

(27) Le docteur est arrivé; elle est dans le salon.

'The doctor [masculine] has arrived; she [feminine] is in the living-room'.

Here again we find that choice of the pronoun is not controlled by formal features of its antecedent. *Elle* is used to refer to a female physician, which brings in conceptual meaning. Such examples (cf. also Lyons 1968: 286) nicely illustrate the difference between syntactic agreement and correspondence between antecedent and anaphor. A word like *docteur*, which is masculine, or for that matter, not marked as feminine, i.e. nonfeminine, may be used to refer to male as well as female physicians. An interpretation of (27) where *docteur* and *elle* refer to the same person is in keeping with their respective meanings. For syntactic agreement it is the categori-

zation of *docteur* as nonfeminine that must be taken into account. (28) is ungrammatical:

- (28) Le nouveau docteur est belle.
 'The new doctor [nonfeminine] is good-looking [feminine].'

But (29) is correct:

- (29) Elle est belle, le nouveau docteur.
 'She [fem.] is good-looking [fem.], the new doctor [nonfem.].'

Such examples motivate the following assumption: agreement is a syntactic condition whose violation results in syntactically deviant sentences. In contradistinction, nonconformity of a pronoun with a potential antecedent does not entail syntactic deviance; nonconformity may, but need not, exclude certain interpretations of a sentence in which it obtains. Agreement, then, is no condition on anaphora.¹⁷ In English too, some use is made of formal lexical correspondences, as in (23) vs. (24), where a pronoun of the appropriate number is selected through knowledge of the lexicon. As exemplified by German, French, and English, both conceptual meaning and associative potential can be exploited in a single language while the relative importance of these factors differs between languages.

6. Pronouns and speaker reference

I have argued that agreement phenomena do not necessitate a relational approach to anaphora. Instead I have supported the demand for a uniform treatment of pronoun occurrences that happen to have antecedents and those that have none (a requirement also made by Stenning 1975 and 1978). Where pronouns are used to refer to entities that may, or may not, have been referred to in the linguistic context, there is no difficulty in conceiving such a theory, once suitable pronoun meanings are provided for: pronouns turn out to be rather normal definite nominals, as already suggested by Stenning (1975, 1978) and Lieb (1979: 376). Things are different if pronoun occurrences are considered where the pronouns appear not to be used for referring at all. This is the case, as has been repeatedly suggested in the literature, if a pronoun has as its antecedent a so-called quantifier expression. If quantifier expressions do not have reference, as has been argued in particular by Geach (1962), an anaphorically used pronoun cannot play what was traditionally considered to be its role, viz. 'picking up the antecedent's reference'; in consequence, neither could the pronoun itself be said to have reference. Thus it may

seem that to account for such pronoun occurrences it is still necessary to have a grammatical antecedent–anaphor relation of some kind.

Unfortunately the term ‘reference’ is often used ‘rather sloppily’ by linguists (as admitted by Wasow 1979: 32 n. 1, who offers the dubious excuse that this ‘is in keeping with the general practice of linguists’). Confusion is created especially if the distinction between semantic reference or denotation (what an expression ‘is able to describe’) and speaker reference (what a speaker refers to) is not properly drawn. I have no space here to enter into philosophical debates but will simply assume the validity of an account (following Strawson 1950; Linsky 1967; and others; cf. Lyons 1977: § 7.2) by which it is speakers who refer by means of linguistic expressions. As an abbreviation we may then say that an occurrence of an expression refers to what the speaker is referring to in using the expression. In contradistinction, an expression may be said to be connected through its meaning to the extension of a concept, i.e. the set of entities to which the concept applies.

Now consider (30).

(30) John has a donkey. He beats it every day.

John may be taken to denote a certain individual, but *a donkey* cannot. *He* may be used to refer to John, but what about *it*? Obviously, a speaker uttering (30) may use *it* to refer to that donkey he was talking about when using the phrase *a donkey*. There is also no obstacle in the way of saying that the speaker referred to some donkey by *a donkey* if a pragmatic notion of reference is accepted. What we must not say is that *a donkey* and *it* are coreferential expressions where it is assumed (as it has been by many linguists) that ‘coreference is an exclusively semantic property’ (Jackendoff 1972: 111).

While theories of semantic coreference are not applicable to quantifier–pronoun pairs, some authors have made proposals which in effect assimilate the treatment of (at least some) such pronoun occurrences to what appears to be the standard case of coreference theories, viz. pairs of referential definite antecedents and referential definite anaphors (cf. Lasnik 1976: 15 n. 9; ‘minimally if two NPs are coreferential they must both be referential’). As far as pronoun occurrences like *it* in (30) are concerned, the idea advanced by Stenning (cf. his identification relation, 1978: 174) and Evans (cf. his E-type pronouns, 1977, 1980) is basically this: if there is no definite antecedent the reference of which the pronoun can pick up, one has ‘to construct from the sentence containing the antecedent quantifier a description which is to fix the reference of the E-type pronoun’ (1977: 535). The result of the construction (‘the donkey John has’) is characterized as follows (1977: 499): ‘Roughly, the pronoun

denotes those objects which *verify* (or that object which verifies) the sentence containing the quantifier antecedent.' Such an antecedent construction becomes necessary if one wants to reject 'the inadequate pragmatic relation of reference' (Stenning 1978: 174)¹⁸ and to sustain the basic conviction of coreference theories: pronouns are given an interpretation on the basis of a relation between linguistic expressions (though the antecedents might not always be explicitly given NPs); by construing anaphora as a relation between expressions, any recourse to speaker intentions is to be avoided. To be successful, then, such an approach has to predict that the reference-fixing descriptions are indeed constructible exclusively in semantic terms. However, Evans himself notices (1977: 517) that the semantic content of the antecedent clause may not be sufficient: 'We should allow the reference of the E-type pronoun to be fixed not only by predicative material explicitly in the antecedent clause, but also by material which the speaker supplies upon demand.' Furthermore, in a dialogue such as (31) "fixing the reference" of an E-type pronoun can involve cancellation of explicit predicative material in the antecedent' (1977: 517):

- (31) A: A man jumped out of the crowd and fell in front of the horses.
 B: He didn't jump. He was pushed.

Thus for two complementary reasons, there is no mechanical procedure for arriving at a reconstructed definite description. If one were to explicate the interpretation of some E-type pronoun occurrence by some hearer in terms of a definite description, one would have to use every relevant piece of information. The information provided by the antecedent clause is just one clue for reconstructing what the speaker was talking about. Evans quite correctly states 'the requirement for the appropriate use of an E-type pronoun in terms of having answered or being prepared to answer upon demand, the question "He? Who?" or "It? Which?"' (1977: 516 f).¹⁹ That is, the court of the last resort that decides what a pronoun occurrence is used to refer to is the speaker who uses it. For pronouns this is no less true than for definite nominals in general.

It is well known that referents of a definite noun phrase occurrence cannot be established simply on the basis of the extension of any concept associated with the noun phrase. First, not every conceivable object in the extension may figure as a referent, but only objects that are 'under discussion'. Second, the referents of an NP may not be in the extension of any relevant concept. If a definite noun phrase is used referentially (as opposed to attributively, see Donnellan 1966; Lieb 1979), it is sufficient that the speaker should BELIEVE the referents to be in the extension (cf. also Lyons 1977: 182). What a speaker can refer to successfully by means

of an NP may or may not be the corresponding semantic referent (if there is one). This was overlooked for a long time by logically minded investigators of language but could not escape the notice of those who had to assess real-life language use: as any student of law will tell you, *falsa demonstratio non nocet*.

As far as pronouns are concerned, this means that the coreference-of-expressions approach fails even where anteceding definite descriptions do exist. It has been convincingly argued by Donnellan (1978) that a pronoun anaphorically linked to an antecedent is ordinarily used to pick up speaker reference. Donnellan (1978: 65) adduces dialogues like (32)–(33):

- (32) The guy in the English department who has been getting chummy with the dean has just gotten promoted to full professor. Shows what things are coming to.
- (33) You are wrong about him. I've investigated and he is far from chummy with the dean — in fact they had a quarrel just last week.

In uttering (33), speaker B uses the pronouns to talk about the man whom speaker A referred to in (32) by the noun phrase *the guy in the English department who has been getting chummy with the dean*.

It is commonplace to regard '*repetition* as the core of anaphora' (Stenning 1978: 165). Wasow's characterization (1979: 1) of the notion 'anaphoric relationship' is just one example: 'When two items A and B in a given discourse are anaphorically related, the full specification of the meaning of B involves (i) referring to the fact that A and B are anaphorically related, and (ii) repeating some part of the meaning of A.' Try and apply this to (32)–(33). Neither does the pronoun 'repeat some part of the meaning of the NP' nor has the pronoun been used to refer to the semantic referent, if any, of the NP: speaker B denies that the man can be described by the NP. Anaphoric use of *him* in (33) is compatible with the fact that the alleged antecedent-NP is, for the speaker, not 'able to describe' the individual he is referring to by *him* (see also Kripke 1977: 270).

Quite generally, pronouns are not used to pick up the semantic referents of anteceding expressions but are used to refer to referents that figure in the given situation-specific universe-of-discourse (in the sense of Lyons 1977: §§ 12.7, 15.3). In the above example, the referent is available at the time of speaker B's utterance because it was previously referred to by speaker A. True enough, speaker A is mistaken in believing that the referent is in the extension associated with his NP. Speaker B may still rely on other information in picking up the referent by a pronoun, such as the proposition of (32), his knowledge of the prejudices of A, etc.

The coreference theory has been questioned by linguists and logicians on account of nonreferential antecedents. What has not been challenged is the assumption that pairs consisting of a referential antecedent and a referential anaphor are the standard case and thus confirm the coreference theory. However, it is precisely in the case of referential antecedents that speaker intentions appear to be crucial in determining the antecedent's referent. Interestingly enough, Lasnik also notes (1976: 6 n. 5) that 'it is possible that the notion of coreference ... should be replaced with that of intended coreference'. But, coreference then ceases to be an 'internal-language' relation, and we can no longer 'maintain that the problem of coreference with a discourse is a linguistic problem and can be studied independently of any general theory of extralinguistic reference' (Karttunen 1976: 366).

7. 'Bound-variable pronouns'

Some pronoun occurrences have been described in the literature as analogues to bound variables in logic. Consider (34):

(34) Every man loves his mother.

(35) John loves his mother.

According to one interpretation, (34) says that for every man x , x loves x 's mother. Comparing (34) and (35), Evans has stressed that we cannot be content with giving 'utterly unconnected explanations of the role of the pronouns' (1980: 345), for example by supplementing a pragmatic approach with an extra device that is to account for 'bound-variable pronouns' (as done, among others, by Lasnik 1976). Instead, Evans suggests, one should try again and assimilate such pronoun uses to the alleged standard case, viz. coreference. This can be done if quantified sentences like (34) receive a substitutional interpretation: the quantifier expression is replaced by singular terms, viz. names (say ' β_1 ', ' β_2 ' ...) of those entities that satisfy the common noun that restricts the quantifier (in this case, names of men). So the interpretation of (34) in a sense reduces to an interpretation of the sentences in (36):

(36) (i) β_1 loves his mother

(ii) β_2 loves his mother

etc.

If *his* in an utterance of (34) is used 'as a device for registering coreference' (Evans 1980: 347) the thus-established antecedent-anaphor relation carries over to the (36) sentences, and in consequence (34) is true iff β_1 loves

β_1 's mother, β_2 loves β_2 's mother, etc. is true. On the other hand *his* in an utterance of (34) may be used 'as a device for making an independent reference to some salient object' (1980: 347), say, Jack. In this case, the occurrences in the substitution instances must also be assumed to refer to Jack. Thus there are two readings of (34), which, by Evans's approach, are based on two ways of interpreting the pronoun, viz. as a coreference device and as an independent-reference device, respectively.

A pragmatic approach on the other hand, Evans claims, can provide only the second reading. It is true, facts about the context of an utterance of (34) can be used to identify some salient object as the intended referent of *his*, but 'there is no way these facts can determine a different referent for the pronoun in each substitution instance' (Evans 1980: 351) as would be required for the 'bound-variable interpretation'. We would have to ensure that *his* in (36i) refers to β_1 , *his* in (36ii) refers to β_2 , etc. — antecedents and pronouns pairing off. To accomplish this, Evans thinks, we need a coreference rule. But Evans's demonstration for the necessity of coreference-pronouns is not conclusive. He asserts that 'the only property of a pragmatic explanation of coreference on which [he] need[s] to rely' (1980: 351) is the fact that such an approach is bound to assume

... that it does not make any sense to enquire into the truth value of the sentence *John loves his mother* considered independently of any particular context of utterance; this is so even when the interpretation of the expressions 'John', 'loves', and 'mother' are given (1980: 350 f.).

This claim is, at the least, misleadingly put. It is indeed uncontroversial that one has to rely on contextual information in finding out what *his* in the sentence quoted could be used to refer to. This must be and is in fact a feature of Evans's own approach, too (a pronoun would not tell us if it is used as a 'coreference device' or not)²⁰! While one need not know a particular context, one has to suppose knowledge of certain properties of the assumed context. Moreover, what one is really bound to assume is that it does not make any sense to enquire into the reference of a pronoun occurrence if nothing at all is known about its context-of-utterance (whereas one can enquire into the extension connected to the pronoun's meaning). But in the circumstances described we do know part of the context, viz. the intrasentential cotext. (It would be, of course, tautological to exclude the intrasentential cotext from the context relevant for reference fixing and to assert on this basis that 'intrasentential coreference' must be rule-governed.) In particular, we are supposed to know 'the interpretation of the expression "John"'. Thus for any utterance of (35) we may assume an intended referent of *John* that may be picked up by *his*.

By analogy, if we accept an interpretation of (34) in terms of its substitution instances, we can assume that *his* in (36i) may be taken to refer to β_1 , etc. Actually, this is not controversial. The point is rather, how do we know when building up the bound-variable interpretation that the antecedent's referent is the only possible referent for *his*?

By Evans's own assumption, the first step in the interpretation of (34) is to decide whether the pronoun is used to refer to some 'salient object' given in advance. Suppose we decide there is no such referent. From this it does NOT follow that the pronoun then must receive its interpretation as the result of some semantic rule as opposed to consideration of the context. Rather the pronoun may still become associated with a referent that is made available in the context but not until a later stage of interpreting the sentence is reached. If we come to interpreting (36i), we know that β_1 is a possible referent for *his*, and, remembering our initial assumption, we know that no other referent was available; thus we know that β_1 is the only possible referent for *his* in (36i); analogously for the other substitution instances.

In order to show that a coreference rule is really not needed we might incorporate these suggestions into a formal semantics. This could be done in a natural way within Hintikka's game-theoretical semantics (GTS; see Saarinen 1979b). A game $G(S)$ correlated with a sentence S represents an attempt of a player called *Myself* to verify S , while the opponent player called *Nature* tries to thwart *Myself*'s strategy. Complex sentences, e.g. quantified sentences, are reduced to atomic sentences in the course of their correlated games. If the resulting atomic sentence is true, *Myself* has won. The initial sentence S is true iff *Myself* has a winning strategy. With respect to quantifier expressions it is assumed that 'in any actual round of this game $G(S)$... the quantifier phrases of S are replaced by proper names of individuals chosen one by one by the one or the other of the two players' (Hintikka 1979a: 32). If a *some* phrase is to be replaced, *Myself* has the choice; in the case of an *every* phrase *Nature* chooses. Pronouns, too, are to be replaced by names.

Where do we get the names replacing the pronouns from? According to the received view where anaphora is construed as a syntactic-semantic antecedent-anaphor relation, we should look at the pronoun's antecedent. The antecedent, of course, might not be a name, but if it is not, it will be replaced by one in the course of the game. Thus if there is an antecedent, there will also be a name that can be substituted in place of the pronoun. But this would mean that in GTS, too, one needs a grammatical mechanism for relating pronouns to antecedents. In fact, according to Saarinen it is 'customary' in GTS to assume that 'the antecedent is determined by syntactical considerations' (1979a: 289),

though Hintikka and Carlson (1979: 195) have rejected ‘approaches to anaphora where the main weight is put on antecedence relations’. Since ‘considering grammatical (syntactical) relations of antecedence only’ (1979: 95) is not sufficient to explain pronominal anaphora, they conclude that in the standard case, pronouns ‘serve to recover a reference to an individual which has somehow been introduced earlier’ (1979: 212). Thus the game rule effecting the replacement of a pronoun by a name should not presuppose the identification of a linguistic antecedent within the original sentence. (Hintikka and Carlson discuss Karttunen’s sentence quoted as [7] above as exemplifying one situation where this would in fact not be possible.) Instead the rule has to relate the pronoun to an individual which has been introduced earlier in the text. Hintikka’s proposal for dealing with anaphorically used pronouns (or *the* phrases, for that matter) is to require them — or to allow them (cf. Hintikka and Saarinen 1979: 157) — ‘to be replaced by a proper name as soon as their antecedent is replaced by this proper name’ (Hintikka 1979b: 86). Adapting this idea to our ends we may require that a singular pronoun is to be replaced by a proper name of some individual *a* either as soon as *a* is made available or not at all.²¹

Consider some game (or subgame) $G(S)$. As soon as some quantifier expression is replaced by a name, this makes available a discourse referent that might become associated with some pronoun in *S*. The pronoun may get replaced by a name of that referent. If the pronoun is not replaced, this chance for giving it a referent is, as it were, missed. The pronoun cannot be assigned a reference until another referent crops up. For pronouns that are used to refer to referents not made available within a game $G(S)$, it seems natural to assume that their referents must be available at the very beginning of the game. Thus such pronoun occurrences are to be replaced as soon as the game starts. Consider now what game is to be correlated with (34). The game may start with Myself substituting a name of some individual of the appropriate sort (depending on the meaning of the pronoun) for *his*, say *John*. (This represents the type of use where some individual is already available as a referent of *his*, since it has for example been identified by an accompanying gesture.) The game is continued with respect to *Every man loves John’s mother*. Now Nature may choose any man’s name as a substitute for *every man*. If Nature does not succeed in finding a man such that he does not love John’s mother, Myself has won. On the other hand, Myself may not utilize the chance of replacing *his* right at the beginning. (This represents a situation where there is no suitable referent available before the processing of the sentence begins.) Nature may replace *every man* by, say again, *John*. This move will make John available as a referent for *his*. John is now also the only

referent available, since Myself has waived to choose another in the first place. (A pronoun has to be replaced 'as soon as possible'.) Thus when encountering *John loves his mother* at this stage of the game, Myself is to choose John as the referent of *his*. Since Nature may present Myself with an arbitrarily chosen individual of the appropriate sort, in these circumstances Myself has a winning strategy only if every man loves his own mother.

I have sketched how to arrive at the two interpretations of (34) in a game-theoretical semantics. No extra mechanism for 'bound-variable pronouns' is required.²² Pronouns are always interpreted by relating them to individuals that have become available somehow. Instead, the ambiguity of (34) is explained in terms of different orders in which the game rules for quantifiers and pronouns are applied. In fact, it is a characteristic feature of GTS to allow for different orders of applying game rules and to explain certain ambiguities from this vantage point.

In this section I have used the framework of GTS,²³ for the sake of the argument, I have adopted the view that anaphora can and should be construed as a purely semantic phenomenon. Even so, a treatment of 'bound-variable pronouns' can be given that does not rely on a grammatical antecedent-anaphor relation. But this is not meant to imply that a purely semantic approach to pronominal anaphora can be accepted as fully satisfactory. The arguments advanced in the preceding section to the effect that pronouns are ordinarily used to pick up speaker referents still stand and can be applied again. Consider (37) and (38) from Smaby (1979: 37 f.):

- (37) John invited Bill and Sam and George to a party at his house.
Everyone had a good time.
- (38) John invited Bill and Sam and George to a party at his house.
Everyone arrived before eight o'clock.

Speaking in GTS terms, which names could be substituted for *everyone* in (34) and (35), respectively? Trivially, the fact that an expression like *everyone* can be used in talking about each and every person should not permit the substitution of each and every name when an occurrence of *everyone* in a particular text is considered: not everyone in the world is under discussion. More importantly, restricting the domain of the quantifier to the objects that have been antecedently mentioned does not suffice. Presumably, *John* is not a good candidate as a substitute for *everyone* in (38) but might be in (37). This difference arises although the preceding context is the same for both quantifier occurrences. Thus there cannot be a semantic rule that determines the quantifier's domain from the 'antecedent text'. A speaker uttering (37) or (38) may still be confident

that his addressee may understand which persons he intends to be under discussion in using the quantifier expression. One thing he may rely on is the proposition of the quantified sentence, but, clearly, command of grammar rules will not suffice for a full understanding of texts like (37) and (38); common sense is required. As noted by Hintikka and Carlson 'collateral evidence' (1979: 195) may be crucial in pronoun interpretation and when this is so their 'explanation, when fully worked out, is a pragmatical rather than semantic one' (1979: 195). It appears that speaker intentions are an unavoidable factor in the interpretation of quantifier expressions. *A fortiori*, the semantic properties of a quantifier alone cannot suffice to determine the interpretation of a pronoun it 'binds'.

There is no need for an intralinguistic coreference-of-expressions rule, if pronouns, including 'bound-variable pronouns', are seen as picking up referents that are contextually available. Since the linguistic cotext is part of the overall context, this idea can be formalized within a semantic approach with some success. But surely it constitutes the core of what has been called a pragmatic approach and can be made fully general only if one accepts a psychologically realistic view of referring. While a quantifier expression does not have a semantic reference, it can be used in referring (by a speaker). A speaker may introduce a referent by means of phrases such as *a donkey*. Hence he may subsequently refer to the referent thus introduced by a pronoun. By *every man* in (34) the speaker may refer to arbitrary men he takes to be under discussion (cf. Lieb 1980a); in addition, he commits himself to defend the proposition of the sentence with respect to each of these; that is, he has to defend at least as much as he would have to defend if he had referred to an arbitrarily chosen particular one referent; in a sense, he is in the same position he would have been in if he had referred to that referent. This resembles modal contexts (cf. Hintikka and Carlson 1979: 212 f.); for instance, a speaker who has instructed his addressee to counterfactually assume the existence of some object may refer to this object as if it does exist. This 'quasi-referent' is available as long as the 'modal game' is played; if the game is concluded, the referent is cancelled. Similarly, playing the '*every* game', the speaker may use a pronoun as if he had referred to a certain individual by means of the quantifier expression.²⁴ After the game is concluded this option will no longer be available; but when the speaker used the *every* phrase to refer to a multiplicity, he may still refer to these referents by a plural pronoun. That is why 'universally quantified singular NP's (e.g. *everyone*) can often control the reference of plural pronouns when they fail to bind a singular pronoun, and plural quantified NP's can always do so' (Reinhart 1983: 83).

8. Anaphoric use of definite nominals

In the preceding I have examined a number of attempts to explain anaphora in terms of a syntactic and/or semantic relation between anaphors and antecedents. Before finally turning to the question of what it means for a pronoun to be used anaphorically, let me sum up what has been said in evaluating such approaches. According to the strongest version of the relational approach, a pronoun is nothing but a syntactic dummy for an antecedent, which does away with any need for a semantics of pronouns. This was clearly inadequate. A weaker version proposes that pronouns are interpreted on the basis of a syntactic relation, in particular an agreement relation. However, examples of nonagreement, missing antecedents, split antecedents, and the like all involve cases where it does not seem plausible to construe anaphora as a syntactically based phenomenon. A semantic approach that simply replaces syntactic agreement by semantic agreement does not overcome these problems. Another version of a semantic-agreement approach that tries to explain the use of pronouns in terms of an objective classification of antecedents' referents has to be rejected, too. Even where there is an antecedent, it is wrong to assume that the choice of a pronoun is an automatic consequence of the objective nature of the referent. Speakers of English are generally free to choose the pronoun that best serves their communicative intentions. That is, pronouns are used according to their meanings. No doubt, there are languages where formal features are crucial for the use of pronouns. These features are also operative with pronouns that do not have antecedents, not even 'missing ones'. In consequence, agreement — whether syntactic or semantic — must be (and, as has been shown, can be) abandoned as a condition on pronominal anaphora.

Nevertheless, one may argue that semantic rules which establish antecedent-anaphor relations should be given. In particular, what a pronoun occurrence in some context may refer to might be taken to depend on the existence of semantic coreference relations for some types of pronoun uses at least. One might even try to extend this approach to cover pronouns that have quantifier expressions as antecedents, i.e. antecedents which are not, in a sense, referring expressions. However, it turns out that pronouns are ordinarily used to pick up speaker referents and, furthermore, that fixing the reference of 'referring pronouns' with quantifier antecedents ('E-type pronouns') cannot in general be accomplished on the basis of semantic considerations alone. On the contrary, speaker intentions have to be admitted as a crucial factor in reference determination. From the point of view of a hearer, semantic considerations, e.g. the specification of which 'objects verify the sentence containing

the antecedent' (cf. above), may be most important in tracing out what a speaker using a pronoun intends to refer to; yet every kind of pragmatic or common-sense reasoning may be pertinent.

Assume that one might still want to adopt an approach based on a semantic concept of reference, leaving aside the role of speaker intentions as a 'complication of language use'. From the consideration of 'bound-variable pronouns' it might appear that some semantic antecedent-anaphor relation is needed anyway. If this relation can be proved in the final analysis to be reducible to a relation of semantic coreference, it may seem profitable to take coreference of expressions as a basic feature for a wider class of pronoun occurrences. But even from a semantic point of view, in order to take care of 'bound-variable pronouns' we need not assume a grammatical relation between antecedent and anaphor *qua* linguistic expressions. Rather, pronouns can be taken to refer to referents available from 'the universe-of-discourse, which is created by the text' (Lyons 1977: 670). Hence we have no reason to insist on a semantic coreference relation and can go back to a pragmatic approach by allowing pragmatic considerations to interact with semantic ones in determining which referents are available from the context.

I submit that all versions of relational approaches must be abandoned. Instead, I adopt the view that the use of pronouns depends on their lexical specifications. What is required, then, are lexical entries for pronouns that specify their conceptual meanings and/or associative potential. Some sample entries were sketched above. Instead of racking our brains to solve the problem of where a linguistic antecedent that 'is not present in discourse ... can be located' (Tasmowski-De Ryck and Verluyten 1981: 154), we should aim at a unified lexical description of pronouns that treats them as normal items in the vocabulary; their use is determined not by any antecedents in a sentence but by their properties as lexical items of the language. Pronouns only differ from 'normal definite nominals' in two respects: first, in the low conceptual content of their meanings; and second, in having a lexical 'associative potential' that is formally based and may serve to restrict the extension of pronoun meanings in pronoun use.

Definite nominals, when used referentially, signal a speaker expectation that 'his audience will be able to recognize his reference' (Donnellan 1978: 65; cf. also Hawkins 1978). There may be different reasons for thinking that an intended referent can actually be recognized. The definite nominal may have been used gesturally (Lieb 1979: 379),²⁵ that is, accompanied by a pointing gesture of any kind — a movement of a hand, a look at the object, etc. — thus the referent may have been singled out by the speaker; or the referent may have been mentioned before; or the referent may

simply be known to the addressee. It is tempting to identify anaphora as 'nongestural use of definite nominals'. 'Anaphoric use' would not be made dependent on the existence of antecedents. No doubt, nongestural use does not presuppose antecedents, but notice that it does not presuppose the referent to be in 'the universe-of-discourse which is created by the text' either. Assume for example that a friend asks you what to do tonight. You may well answer with (39) if you have reason to believe that he knows of the nice restaurant:

(39) Let's go to the nice restaurant again.

The referent of *the nice restaurant* is not supplied by the situational context-of-utterance, nor has it been mentioned before: it has not been established as a 'discourse referent' (Karttunen 1976) in advance. It does not have to be unique either (as e.g. with *the earth*): there may be more than one restaurant that the friend would call nice, but this is harmless as long as background knowledge is ordered in some way. (Possible referents may be accessible to differing degrees, and the amount of descriptive information needed for their identification will vary.) Quite generally, it is sufficient for referents of definite noun phrases that they be recognizable on the basis of whatever background knowledge there is — they must be identifiable in the speaker's 'reference basis' (Lieb 1979, 1980a).

Nevertheless, we might wish to distinguish different uses of definite noun phrases in terms of the bases for referent recognition: (i) definite noun phrases 'introduced *tout court*' (Donnellan 1978: 64) where the speaker counts on the nonlinguistic background, (ii) definite noun phrases used gesturally where the speaker relies on paralinguistic means, and (iii) definite noun phrases used where the speaker relies on the linguistically created universe-of-discourse. Given the examples of anaphora in the literature, the third type seems to be a natural candidate for 'anaphoric use' and would also agree with the examples I have used in this paper. As Lyons (1977: 673) puts it, 'Anaphora presupposes that the referent should already have its place in the universe-of-discourse.' It follows that definite nominals can be used in a way that does not qualify either as gestural or as anaphoric. This holds for 'full NPs' (as illustrated by [39]) as well as for pronouns. Background knowledge alone may be sufficient to pick out the intended referent of a pronoun occurrence. For instance, somebody rushing to keep an appointment might burst into the room with the question

(40) Has he already arrived?

assuming that his addressee knows the second party in the appointment.

It is true, the low descriptive content of pronoun meanings severely

limits their use in referring to referents that are not in the universe-of-discourse; referents for pronouns may be identified by gestures but are mostly introduced in the linguistic cotext. As should have become obvious, this is not meant to imply that the referents of anaphorically used pronouns have to have been introduced by means of antecedent nominals; cf. (41):

(41) Does John have a car? — Yes, it is a Mustang.

Following Karttunen (1976: 383), we may assume that 'indefinite NPs in yes-no questions ... do not establish referents'; on the contrary, the referent for *it* is available because the question has been answered positively. What it means for a referent 'to already have its place in the universe-of-discourse' must be understood rather broadly. For a further illustration let us return briefly to 'problems with number agreement' (cf. section 2).

As noted already with respect to cases of missing antecedents, the semantic interpretation of the complete cotext has to be taken into consideration. In (22) there are two destroyers under discussion; consequently, a plural pronoun may be used to anaphorically refer to them. Similarly, in (18), two girls are under discussion; hence the inappropriateness of *her* as an anaphor. Actually, *her* could have been used as an anaphor if the second conjunct in (18) had read *in both cases I knew her*. This emphasizes again that the semantic interpretation of the whole sentence (not only of a possibly existing antecedent) is pertinent to understanding the pronoun's reference; in contradistinction, examining whether a syntactic agreement condition is met would not be much help. Commenting on 'exceptions' to number agreement in German similar to (11), Hermann Paul (1919: § 169) already noted that a combination of a singular antecedent and a plural anaphor is not unusual whenever the clause containing the pronoun makes a general statement on the species to which the individual referred to by the antecedent belongs. This means, where an individual of some species is available in the universe-of-discourse, this may suffice to subsequently refer to that species, or rather all of its members, by a plural pronoun. Although the referents of the pronoun have not been introduced previously in a strict sense, we may say, that they are nevertheless retrievable from the universe-of-discourse. True, anaphora by pronouns means to resume the thread; however, such cases show that anaphorically used pronouns are not strictly limited to 'point to structures in the model that has been constructed' (Stenning 1978: 196). At least from the point of view of the hearer, they may add to the 'discourse model'. This may also be the case where the pronoun's referent has been introduced by means of an indefinite nominal; cf. (42):

(42) Socrates owned a dog and it bit Socrates.

Evans (1980: 343) notes that it is due to the pronoun *if* (42) bears the implication that Socrates owned just one dog. Similarly, where *he* or *she* is used to refer to some person that has been referred to antecedently by, say, *the teacher* or *Hilary* (cf. Kamp 1981), this may add to the hearer's knowledge of the reference objects.²⁶ Compare also (13) where *it* or *them* may be used, although the antecedent *this kind of animal* is in the singular. Instead of being triggered by syntactic features of the antecedent, the choice of the pronoun tells the hearer how the speaker conceives of what he is talking about. Presumably, 'kinds are a bit like teams' and may be construed as individuals or as multiplicities ('all its members', Carlson 1977: 435 n. 16) and may be referred to accordingly.

Insofar as a pronoun has semantic content, it can be used informatively. Anyway, the cases considered exemplify use of pronouns where the linguistically created universe-of-discourse serves as the principal basis for referent recognition. Lyons (1977: 672) considers *her* in (43), too, to be anaphoric:

(43) I was terribly upset to hear the news: I only saw her last week.

where the context is offering condolences to a friend whose wife has just been killed in a car crash. It seems to me, however, that this would overextend the notion 'anaphora'. The referent for *her*, provided (43) is the complete discourse to be considered, is not available from the LINGUISTICALLY CREATED universe-of-discourse; when (43) is uttered in corresponding circumstances, *her* exemplifies the first type of use distinguished above (where the speaker relies on the nonlinguistic background).

Admittedly, the tripartite distinction I have drawn may not always give clear and undebatable results, in particular since referents may be recognizable for more than one reason. There are also cases that are not yet covered. One such case can be found on a poster of a German political party. The party's emblem is a hedgehog. There is a picture of a hedgehog on the poster with the caption (44):

(44) Macht ihn stark.
'Make it [masc.] strong.'

Ihn is used because *Igel*, 'hedgehog', is masculine. A picture certainly does not qualify as a linguistic antecedent. Therefore, does (44) illustrate a kind of ostensive use — where layout replaces a pointing gesture to the picture — or is it a referent of a nonlinguistic sign that is picked up here? Distinguishing pronoun occurrences in terms of bases for reference recognition can be useful in order to throw into relief typical ways of using pronouns; it does not yield a clear-cut classification. The resulting vagueness is not a theoretical flaw, however, but reflects the nature of

reference. It is only 'by means of various subtle contextual clues' (Kaplan 1978: 229) that somebody else's intended referent can be identified, and pronoun use is no exception. No grammatical ambiguity of pronouns should be assumed to explain different types of pronoun use; and an antecedent-anaphor relation must not be taken to be essential to the description of pronouns if a uniform approach is to be realized.

I conclude by comparing different ways of describing pronoun occurrences. Two theses may be suggested:

- (45) A pronoun is used to refer to a referent that is assumed to be recognizable for a hearer despite the low reference-determining potential of the pronoun (conceptual meaning and associative potential).
- (46) A pronoun is used to refer to a referent that is in the extension of some referential phrase in the linguistic cotext that agrees (in some sense) with the pronoun.

(45) attempts to characterize informally the use of definite pronouns in general, while (46) identifies a restricted subcase. Descriptions (47) to (49) characterize intermediate cases of decreasing generality, which makes (46) the most specific:

- (47) A pronoun is used to refer to a referent that is retrievable from the universe-of-discourse created by the text.
- (48) A pronoun is used to refer to a referent that has been introduced in the linguistic cotext.
- (49) A pronoun is used to refer to a referent that belongs to a class associated with some referential phrase in the linguistic cotext.

(46) remains a subcase even if it should turn out to cover most pronoun occurrences. Forcing each and every pronoun occurrence into this mold would lead to gross absurdities, as has been amply demonstrated by linguists looking for linguistic antecedents where there are none, and for agreement that does not exist. (47), it seems to me, pinpoints quite well the phenomena that have usually been subsumed under the heading *anaphora by pronouns*. What should be rejected, then, is the idea that pronouns' referents may be 'computed' from the cotext, where antecedents are determined ideally by algorithmic procedures. I take the more realistic view that the referent of a pronoun is at best retrievable from the context, that is, may be discovered, with luck, by heuristic strategies.

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Freie Universität Berlin
Fachbereich Germanistik
Habelschwerdter Allee 45
1000 Berlin 33
West Germany

Notes

- * This is a revised and expanded version of a paper read to the *Linguistisches Kolloquium* at the *Freie Universität Berlin* in May 1981. I am very grateful for comments and suggestions on earlier versions to Peter Eisenberg, Dietrich Hartmann, Dietmar Rösler, Harald Weydt, and especially, to Hans-Heinrich Lieb. This paper could not have been written without relying heavily on the ideas presented in Lieb's studies (see references). Special thanks to Flora McGeachan for helping me with my English.
1. The way out that suggests itself in a transformational approach would be to derive sentences like (1) from remote structures which do not contain split antecedents, i.e. where all antecedents are constituents. However, it could be shown that this is not a viable avenue for a number of reasons (for discussion see Dougherty 1969; see also Anderson 1970; Perlmutter and Ross 1970).
 2. The transformational approach also puts anaphoric personal pronouns on a par with reflexives, which would mean that both originate from substitution. Dougherty's argument may therefore be strengthened by showing the nonuniformity of reflexives and anaphoric personal pronouns; cf. Wasow (1979). In more recent publications reflexives, as opposed to personal pronouns, are taken to constitute a type of 'bound anaphora'; see e.g. Helke (1970), Chomsky (1980b). In this paper I will not deal with reflexives.
 3. Cf. Chomsky (1980a: 281 n. 26): 'We may think of the term 'coreference' here as referring to a syntactic association of the two NPs that is a factor in their ultimate interpretation.'
 4. Agreement cannot be a sufficient condition, insofar as there are other conditions on anaphora — configurational conditions. Our way of speaking is justified, however, as we presuppose that conditions of other types, if there are any, are satisfied.
 5. Bach tried to demonstrate this by (i, ii) (1970: 121):
 - (i) My neighbor who is pregnant said that she was very happy.
 - (ii) My neighbor who is pregnant said that he was very happy.

It is true, these examples do not prove the point. Obviously, it is a matter of fact, not of grammar, that a male neighbor is rather unlikely to be pregnant. But this does not affect the structure of the argument: the antecedent could not be taken as an NP that excludes a modifying relative clause IF correct choice of the pronoun may depend on grammatical properties of this clause.

6. From a purely formal point of view one could not deny the fact that there is a 'proper' antecedent for *she* in (21), viz. *wife*. It is due to considerations of semantic adequacy that one speaks of 'missing antecedents'. For other types of missing antecedents see Carden and Miller (1970) and Bresnan (1971). Some of their examples may be awkward from a stylistic point of view but would have to be in fact unintelligible if anaphora were a syntactically based phenomenon.
7. The question of whether English exhibits grammatical gender has some tradition, cf. e.g. Hall (1951).
8. Incidentally, the term 'natural gender' is often employed without appropriately distinguishing between (i) a semantic classification of words, (ii) a biological classification of reference objects, and (iii) a classification of reference objects guided by the actual use of English personal pronouns. Cf. e.g. Stanley (1977: 43): 'Natural gender refers to the classification of nouns on the basis of biological sex, as female or male, or animate and inanimate.'

9. Hankamer and Sag (1976: 392 n. 5) introduced 'the cross-hatch (#) as an indication that the so marked sentence is incompatible with the indicated context (presuming, of course, the absence of any previous significant linguistic context).'
10. This is naïvely assumed by Katz (1972: 371, n. 2), whose reliance on biological classifications invalidates his arguments for syntactic gender in English. Cooper, too, bases his semantic treatment of 'natural gender' on the assumption that 'natural gender or sex gender ... appears to be determined by the actual sex of the objects denoted or quantified over' (1975: 66, but see also 134 n. 2). He assumes that in 'order to express natural gender we may divide the set of entities into three subsets or sorts which consist of the set of male entities, the set of female entities and the set of neuter entities' (1975: 67 f.). Thus he advocates what I call an 'objective-classification approach' below.
11. Kruisinga (1932: 96 f.), who treats gender as a classification of expressions, put this as follows: 'the masculine may be considered the usual animate gender, both for names of male beings and others that have nothing to do with sex'. But see also Stanley (1977: 60–66).
12. It is ships that are, in a sense, womanly, not *ship* that is feminine (contrary to Gruber 1976: 287 f.), or as Martinet (1962: 16) put it, *she* may be used to refer to some machine English speakers choose to consider as 'female'.
13. Lieb assumes that meanings of lexemes are concepts in a psychological sense. The reconstruction of the notion of concept starts from individual perceptions and conceptions, that is, mental states. Any perception or conception has a content. As for perceptions, if somebody perceives some physical object, he attributes certain properties to what he perceives. The content of the person's perception is the set of these properties; similarly for conceptions. A concept is a property of perceptions and/or conceptions, viz. the property of being a perception in whose content a specific property occurs. For an outline of this approach and a demonstration of its linguistic adequacy see Lieb (1980b) (cf. also the references cited therein). The convention of using English words between raised dots as names of concepts is taken from Lieb (1979: 364).
14. The pronoun *it* deserves a special treatment. Of course, in the case of so-called prosententialization it makes no sense to ask for agreement. Moreover, it is pretty clear that the existence of a CONSTITUENT functioning as an antecedent is no condition for such uses of *it* (cf. Jackendoff 1972: 272). I have not relied on such facts in rejecting relational approaches to anaphora — although they strongly favor my argumentation — in order to avoid any impression of begging the question. To account for such uses we may have to posit an additional meaning for *it*.
15. Put in another way, the respective meanings of English third-person personal pronouns are such that they can be ordered with respect to what has been called the 'animacy hierarchy' (Comrie 1981: ch. 9). They may also be fitted into Givón's system of 'binary hierarchic relations', especially those that reflect 'the ego/anthropocentric nature of discourse' (Givón 1976: 152), though we had to use PERSONAL > NONPERSONAL in place of his HUMAN > NONHUMAN and to add MANLY > WOMANLY. Note that these relations are not naturally but socially based.
16. It is not true that the 'pronoun used in referring to *Mädchen* will be *sie* — "she": formerly the neuter *es* was used but now *sie* is usual' (Corbett 1979: 205). Nevertheless, the facts conform to Corbett's theory of the agreement hierarchy (1979: 223): 'The further an element stands from its controller in terms of syntactic distance, the more likely is semantic agreement', although the formulation in terms of 'controller' and 'semantic agreement' is misleading with respect to the case under discussion.

17. Givón has argued 'that agreement and pronominalization ... are *fundamentally* one and the same phenomenon' (1976: 151; italics mine). It is true, considerations of diachronic relationships and functional similarities may add to our understanding of the two phenomena. But there is certainly no reason to obscure the distinction with respect to language systems that in fact exhibit it. It is particularly unconvincing to construe personal pronouns (on one type of use) in Modern Standard English — where agreement plays nearly no role — as 'syntactic agreement pronouns' (Bosch 1980), i.e. as a sort of agreement morphemes.
18. Stenning terms his approach a pragmatic one, but he rejects a pragmatic notion of reference as crucial for pronoun interpretation and stresses that in determining what a pronoun with an indefinite antecedent 'points to' 'no resort to "the object the speaker had in mind" is necessary, since objective criteria for identification can be stated' (1978: 177); the 'logical force' of such a pronoun occurrence (though not its meaning) 'is partially a function of its context of occurrence, and ... therefore requires a pragmatic approach' (1975: 189). However, it is not necessarily beyond the scope of a semantic approach to determine a pronoun's interpretation by considering the semantic interpretation of the (extrasentential) cotext (as demonstrated by Evans), and this is exactly what Stenning attempts in his discussion of antecedent-anaphor relations. In spite of its programmatic pragmatic orientation, the treatment of pronoun occurrences like those under discussion is as semantic as Evans's and is thus open to similar objections (in addition, 'bound-variable pronouns', cf. below, are not taken care of satisfactorily).
19. Most remarkably, Evans tells us (1977: 517 f.): 'In attempting to formalize the treatment of E-type pronouns ..., I shall ignore the wrinkle introduced by this liberalization. I hope it is obvious how it can be incorporated into the final product.' I think it is not obvious; rather, this claim seems to be a wrinkle indeed.
20. Stress and intonation may be relevant but are not considered in this paper.
21. I say 'available' — not 'introduced' — since a referent introduced in a subgame (cf. Hintikka and Carlson 1979) is available outside that subgame, if at all, only after it has been completed.
22. Evans argues that no extra mechanism should be introduced to handle 'bound-variable pronouns' (although he assumes that there are different 'kinds of pronouns', 1980: 344). Variables, however, are but one such extra device. In fact, since pronouns as 'devices for registering coreference' are really not needed to treat sentences like (35), a rule that establishes a coreference relation between pronouns and antecedents is another type of extra mechanism. (Yet another type are, for instance, Bosch's [1980] so-called syntactic agreement pronouns.) Evans's coreference approach would be required, if at all, only in the interpretation of quantified sentences. In short, Evans's extra-device argument applies to his own approach as well.
23. I have not entered into any detailed questions concerning a GTS analysis of anaphora and pronouns since it has not been my aim to provide a formal theory nor to argue for the GTS position in particular. The point is rather that a uniform approach to pronouns can be obtained if pronouns are construed as picking up individuals that are made available in the context. GTS is an example of a theory that can be so understood. Another one is Kamp's 'theory of truth and semantic interpretation' (Kamp 1981). Actually, both approaches are similar in a number of respects (e.g. as acknowledged by Kamp, the treatment of conditionals, or, more generally speaking, the idea of a subgame/subrepresentation; compare also Kamp's discourse representations to the 'sets of simple sentences' in Hintikka and Saarinen 1979: 172 f.). Kamp advances 'the hypothesis that both deictic and anaphoric pronouns select their

referents from certain sets of antecedently available entities' (1981: 283), but he does not incorporate 'deictic pronouns' into his theory. Rather he assumes that if a text containing pronouns 'is used by itself, i.e. without preceding verbal introduction, and also in the absence of any act of demonstration, then — and this is another important hypothesis of our theory — there are no other potential referents for [the occurring pronouns] than the discourse referents that have been introduced in response to [other expressions within the discourse]' (1981: 285).

As it stands, this is not entirely correct, since pronouns 'introduced *tout court*' (see below) are ignored. But if amended accordingly, we may apply Kamp's approach to Evans's argument: the hypothesis quoted then resolves the problem of isolating β_1 as the only possible referent for *his* in (36i) etc. notwithstanding that 'the syntactic analysis of a sentence of the present fragment [dealt with in Kamp's theory] tells us nothing about anaphoric relations' (1981: 301). This is due to the fact that the fragment 'contains neither variables nor indexed pronouns' (1981: 301) and thus is immune to the methodological objections raised in section 1, above. Kamp's approach, then, can be extended to cover deictic pronouns in a similar way as GTS.

24. One might try to define the stretch over which the game can be played in syntactic terms like c-command (Reinhart 1979; Evans 1980) and argue that configurational conditions play a significant role in anaphora. Note, however, that such conditions would define how the use of certain NPs (as e.g. *every man*) contributes to the momentary discourse model. They do not affect the interpretation of anaphorically used pronouns: as I said, these are always interpreted as picking up individuals that are made available in the context. (Configurational constraints that are not designed for 'bound-pronoun' constellations can be dispensed with in favor of pragmatic explanations anyhow, see Reinhart 1983.)
25. Use of the term 'gestural' instead of Lyons's 'deictic' has the advantage of making available two different terms for two distinct types of 'pointing to the context', viz. pointing by virtue of the lexical meaning of words such as *I, you, here, today*, etc. (deixis in a narrow sense), and pointing by virtue of nonverbal devices such as gestures in connection with 'referring expressions' (*the ball, he*, etc.). With pronouns that have deictic meanings, the referent has not to be looked for in the linguistically created universe-of-discourse but in the situational context-of-utterance. Thus, even though a pronoun like *you* may serve to refer to a referent that has been referred to before, this does not constitute a case of anaphora.
26. Cf. also Germ. (i):
 - (i) Helge sagte, daß er sehr glücklich sei.
'Helge said that he was very happy.'

Whereas *Helge* may be a name of a male or a female person, the use of *er* indicates that Helge is a male, which demonstrates again the need for conceptual meanings of pronouns even in the case of languages like German.

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